were positively correlated to age ($p < 0.05$). This effect was caused by slightly rising total treatment costs over age and a declining number of patients fulfilling the effectiveness criterion.
CONCLUSION: Cost-effectiveness ratios are positively correlated to age in the treatment of moderate asthmatics.

PP3

INCREMENTAL COST OF DISEASE IN NOSOCOMIAL PNEUMONIA FROM A HOSPITAL'S PERSPECTIVE: A FEASIBILITY STUDY

Dietrich ES[1], Hug S[1], Mast O[2], Schulgen G[3], Daschner F[1]
[1]Institute of Environmental Medicine and Hospital Epidemiology, University Hospital, Freiburg, Germany; [2]Health Economics and Outcomes Research, Bayer Vital, Leverkusen, Germany; [3]Institute of Biometry and Medical Informatics, University Hospital, Freiburg, Germany

OBJECTIVE: To investigate the feasibility of different methodologies for a prospective matched-pair design study on the incremental daily cost of disease for patients with nosocomial pneumonia (NP) from a hospital's perspective.
METHOD: Adult patients newly admitted to three ICUs with <3 days of hospitalization and without preexisting pneumonia were followed up daily until discharge (maximum 30 days). Any new onset of NP was registered. Gender, age, diagnosis at admission, underlying disease, surgery, ward, further diagnosis, Apache II-Score, and Kropec-Pneumonia-Risc-Score were preselected as matching criteria for controls. Consumed resources were documented daily. Costs were calculated by two methods: a combined bottom-up approach (resource consumption of drugs, blood products, diagnostics, other medical materials) and top-down approach (proportionate cost based on accounting figures by ward for all other costs). Alternatively, all costs were calculated top-down based on administrative data.
RESULTS: In 25 days 112 patients were registered; 50 met all study criteria, of whom 3 developed nosocomial pneumonia. Matching was possible only on gender, age, reason for admission (eight categories), ward, hospital days until onset, immunosuppressive and respiratory status. The average incremental daily cost for patients with NP was DM 440 ± 140%. Both costing methods led to similar results (2% difference). The first method required significantly more time for data collection. The sample size for a study, given that the 95% confidence range of cost equals the mean of the incremental cost (33%), is 40 patients with NP, plus an adequate number of controls.
CONCLUSION: The approach involving some bottom-up data is not feasible for a full study. The top-down only approach more efficiently leads to quite similar results. For reconfirmation, a larger sample size would be necessary. However, time saved accompanies a loss in precision. In the future, more wards, with preferably long average stays, should be included to efficiently document more cases of nosocomial pneumonia.

PP4

ECONOMIC IMPACT OF SMOKING IN GERMANY

Ruff L[1], Meyer A[1], Volmer T[2], Nowak D[3]
[1]Medizinische Klinik, Universitäts-Krankenhaus Eppendorf, Hamburg, Germany; [2]GlaxoWellcome, Hamburg, Germany; [3]Institut und Poliklinik für Arbeits und Umweltmedizin, Ludwig Maximilians-Universität, Munich, Germany

Smoking is a high-risk behavior affecting the health and economic welfare of a society. Thus it is important to quantify the economic burden of the negative impact due to smoking in Germany. Approximately 33.4% of the male and 20.4% of the female German population are current smokers.
OBJECTIVE: This study investigates the healthcare costs of smoking on the six most frequent diseases associated with the inhalation of tobacco smoke: lung cancer (ICD 162; attributable to smoking, 89%), cancer of the mouth and larynx (ICD 140–149, 161; 85%), chronic obstructive pulmonary disease (COPD, ICD 490–491; 73%), coronary artery disease (ICD 410–414; 35%), stroke (ICD 434–438; 28%), and atherosclerotic occlusive disease (ICD 440; 28%).
METHODS: A data search was carried out using several literature databases including MedLine and DIMDI, as well as health insurance and Federal Institute of Statistics databases.
RESULTS: Total smoking-related costs for these diseases in Germany are 31.4×10^9 DM, equivalent to 49% of the overall costs. In detail (1995 figures), smoking-related lung cancer contributes 4.8×10^9 DM, cancer of the mouth and larynx 2.5×10^9 DM, COPD 11.3×10^9 DM, coronary artery disease 8.6×10^9 DM, stroke 3.1×10^9 DM, and atherosclerotic occlusive disease 1.1×10^9 DM.
CONCLUSION: The conservative calculation of the economic impact based on only 6 of more than 25 diseases known to be associated with smoking results already in a burden of more than 31 billion DM. Further detailed analyses are needed to better quantify the health economic impact.

PIM1

COST-EFFECTIVENESS ANALYSIS OF A FIXED COMBINATION (DICLOFENAC + MISOPROSTOL) IN THE PREVENTION OF GASTROPATHY IN ARTHRITIS PATIENTS IN BELGIUM

Annemans L, Vanoverbeke N, Van Rompay W
HEDM, Mechelen, Belgium

OBJECTIVES: To calculate the costs and cost-effectiveness of a fixed combination of diclofenac 75 mg + misoprostol 200 μg bid compared with diclofenac 75 mg bid in preventing gastropathy in Belgium.
METHODS: We developed a new decision-analytical model comparing diclofenac + misoprostol (DM) to diclofenac (D), taking into account clinical data on gastrop-

athy and data on medical practice in case of gastropathy. The time horizon was 3 months. Dyspepsia rates, ulcer rates in patients with symptoms, and silent ulcer rates were obtained from a large prospective trial (n = 514) and recalculated by using Bayesian analysis. Current medical management of NSAID-related gastropathy was obtained through a review of 102 patient records in primary care and through expert interviews (2 rounds Delphi method). Costs were taken from the perspective of the health insurance. Unit costs were obtained from official listings; hospitalization costs for peptic ulcer were collected from a database of 58 hospitals.

RESULTS: Effectiveness—expressed as number of patients free of symptomatic ulcer and as saved lives—was greater for DM: 4 patients out of 100 developed symptomatic ulcer, compared to 12 with D. In 100,000 patients, there would be 42 fatal cases with DM, compared to 106 with D. At a daily cost of 45.57 BEF for DM and 33.46 for D, the results showed an average cost savings of 2,834 BEF per patient if treated with DM, mainly because of a reduced hospitalization cost. Sensitivity analysis around the confidence intervals of the key variables did not change the conclusions.

CONCLUSIONS: Diclofenac + misoprostol is a dominating strategy compared to diclofenac alone. It prevents gastropathy and is cost-saving for patients needing medium- to long-term treatment with NSAIDs (3 months).

PIM2

COST OF ILLNESS IN EARLY RHEUMATOID ARTHRITIS STRATIFIED FOR SOCIAL STATUS

Merkesdal S, Ruof J, Mau W, Zeidler H
Department of Rheumatology, Medical School of Hannover, Hannover, Germany

OBJECTIVE: To assess the relationship between different components of cost of illness and social status in an early rheumatoid arthritis (RA) cohort.

METHODS: 133 consecutive outpatients (age: 47 ± 10 years, 63% female) with early RA (mean disease duration: 7 ± 4 months) fulfilling the diagnostic criteria for RA were enrolled. All patients were gainfully employed at onset of symptoms (T1). Data collection was performed using standardized interviews at T1 and 12 months later (T2). The mean observation period was 19 ± 4 months. Three major cost components were analyzed: 1) costs for application and monitoring of disease modifying antirheumatic drugs (DMARD; direct costs), 2) loss of productivity due to sick leave, work disability, and other work loss (indirect costs), and 3) patient-related non-reimbursed costs. Social status was measured by the patient education level (low or no degree vs higher degrees).

RESULTS: The main results are shown in the table. Indirect costs are significantly higher in patients with lower levels of education and expenses concerning non-reimbursed treatment and medication tend to be less. No differences can be seen in the use of DMARD.

Major cost components dichotomized by education level

Education level	DMARD costs	Indirect costs	Patient-related costs
Low degree (n = 72)	115 552 DM	40 095 DM	690 DM
High degree (n = 61)	90 627 DM	22 935 DM	1252 DM
Student's *t*-test	$p < 0.1$	$p < 0.005$	$p < 0.1$

CONCLUSION: Indirect costs were found to be especially related to social strata in patients with early RA. Further research is needed to identify indicators that may explain these findings. Distinct therapeutic measures must be taken for these patients already in early stages of the disease.

PIM3

QUALITY OF LIFE SCORES AS PREDICTORS OF FUTURE HEALTHCARE RESOURCE USE IN PATIENTS WITH ARTHRITIS

Kong SX[2], Wolfe F[1], Kahler K[2]
[1]Arthritis Research Center, University of Kansas, Wichita, KS, US; [2]Merck & Co., Inc., Whitehouse Station, NJ, US

	PCS	MCS	HAQ	FT	ANX	FAT	GIS	Pain	SAT	COM	Global
HCV	4.70	7.28	7.12	4.83	5.40	6.35	3.28	5.38	8.75	4.78	6.58
GIV	5.59	7.36	5.61	6.44	5.16	6.12	5.50	5.98	7.39	6.89	6.82
HOSP	1.14	3.85	1.42	2.24	3.09	3.45	2.69	2.07	2.54	4.39	4.81
NSAID	2.59	0.29	2.63	2.34	0.60	2.06	1.78	1.67	2.07	0.24	1.10
GI	1.51	4.69	1.99	4.45	4.23	3.97	8.96	3.63	2.09	6.87	3.12

Z-scores: $>1.96 = p < 0.05$; $>2.58 = p: 0.01$; $>3.28 = p < 0.01$.

OBJECTIVES: Quality of life (QoL) and related measures are increasingly used in the evaluation of patients with arthritis. But a relatively uninvestigated area is the relationship between QoL, healthcare resource utilization and costs. We studied the ability of QoL measures to predict future healthcare resource use.

METHODS: 412 patients with osteoarthritis of the knee or hip and 796 patients with rheumatoid arthritis completed QoL assessments. Their healthcare resource use was measured 6 months later. QoL assessments included SF-36 physical and mental component scores (PCS, MCS), health assessment questionnaire (HAQ), feeling thermometer (FT), pain, fatigue (FAT), anxiety (ANX), satisfaction with health (SAT), and comorbidity (COM). Healthcare resource use included visits to all healthcare workers, GP/internal medicine visits, hospitalizations, NSAID usage, and gastrointestinal (GI) drug use.

RESULTS: In general, after controlling for the effect of demographic variables, the best predictors for physician visits were QoL mental components, global health measures, and patient global assessment of health. Comorbidity was the best predictor for hospitalization. Use of